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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/776,009	02/02/2001	Michael A. Vyvoda	MSI-1	7430

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EXAMINER

MAI, ANH D

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 10/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/776,009

Applicant(s)

VYVODA ET AL.

Examiner

Anh D. Mai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) 15-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 30-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,5,7. 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claim 1-14 and 30-56 in Paper No. 10 is acknowledged. The traversal is on the ground(s) that "the Office has alleged –but not substantiated- that the proposed process could be applied to "any" surface". This is not found persuasive because applicant fails to show -and prove- that the claimed device can only be made or cleaned by the claimed method.

The requirement is still deemed proper and is therefore made FINAL.

Specification

2. Update of the commonly-assigned U.S. Patent Application to Vyvoda et al. (page 10 line 33) is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

3. Claims 1, 6-12, 14, 30, 35-41, 43, 44, 49-54 and 56 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Lee et al. (U.S. Patent No. 6,258,696).

Insofar the device is concerned, Lee teaches a wafer having a surface as claimed including:

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a plurality of regions of semiconductor (402') and dielectric (403) exposed at the surface of the wafer (400) after chemical mechanical planarization, wherein the semiconductor (402') regions have a total surface area that is less than or equal to a first fraction of a total surface area of the wafer (400) and each of the semiconductor regions have a shortest surface dimension that is less than or equal to a first width, the first fraction and the first width ensuring that the surface of the wafer can attract enough water to wet sufficiently allowing removal of residual particles therefrom. (See Fig. 4E, col. 1-10).

Product by process limitation:

The expressions “after chemical mechanical planarization” and “allowing removal of residual particles therefrom” are taken to be a product by process limitation and is given no patentable weight. A product by process claim directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See *In re Fessman*, 180 USPQ 324, 326 (CCPA 1974); *In re Marosi et al.*, 218 USPQ 289, 292 (Fed. Cir. 1983); and particularly *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product “gleaned” from the process steps, which must be determined in a “product by process” claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a new method is not a patentable product, whether claimed in “product by process” claims or not.

With respect to claim 6, the semiconductor regions (402') of Lee comprises silicon.

With respect to claim 7, the dielectric region (403) of Lee comprises silicon dioxide.

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With respect to claim 8, the regions of dielectric (403) and semiconductor (402') of Lee alternate along the surface of the wafer (400).

With respect to claim 9, the regions of dielectric (403) of Lee are elongated strips.

With respect to claim 10, the regions of semiconductor (402') of Lee are elongated strips.

With respect to claim 11, the regions of dielectric (403) of Lee are rectangular.

With respect to claim 12, the regions of semiconductor (402') of Lee are rectangular.

With respect to claim 14, the region of semiconductor (402') of Lee are interspersed within a sea of dielectric.

With respect to claim 30, insofar the device is concerned, Lee teaches a wafer having a surface as claimed including:

means for attracting water (403) to the surface of the wafer (400); and

means for repelling water (402') from the surface of the wafer (400) comprising regions that have a combined surface area that is less than or equal to a first fraction of a surface area of the wafer, wherein each of the regions has a shortest surface dimension that is less than or equal to a first width, and the first fraction and the first width ensure that the surface of the wafer can attract enough water to wet sufficiently allowing removal of residual particles therefrom. (See Fig. 4E, col. 1-10).

With respect to claim 35, the means for repelling water of Lee comprises silicon (402').

With respect to claim 36, the means for attracting water of Lee comprises silicon dioxide (403).

With respect to claim 37, the means for attracting (403) water of Lee comprises elongated strips of dielectric.

With respect to claim 38, the means for attracting (403) water of Lee comprises of rectangular regions of dielectric.

With respect to claim 39, the means for attracting (403) water of Lee comprises dielectric regions (403), the means for repelling (402') water comprises semiconductor regions (402'), and wherein the dielectric regions and semiconductor regions alternate along the surface of the wafer.

With respect to claim 40, the means for repelling (402') water of Lee comprises elongated strips of semiconductor.

With respect to claim 41, the means for repelling (402') water of Lee comprises of rectangular regions of semiconductor.

With respect to claim 43, the means for attracting (403) of Lee comprises dielectric, the means for repelling (402') water comprises semiconductor regions, and the semiconductor regions (402') are interspersed within a sea of dielectric.

With respect to claim 44, insofar the device is concerned, Lee teaches a wafer having a surface as claimed including:

a plurality of regions of hydrophobic material (402') and hydrophilic material (403) exposed at the surface of the wafer (400) *after chemical mechanical planarization*, wherein the regions of hydrophobic material (402') have a total surface area that is less than or equal to a first fraction of a surface area of the wafer (400) and each of the regions of hydrophobic material (402') have a shortest surface dimension that is less than or equal to a first width, and the first

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fraction and the first width ensure that the surface of the wafer (400) can attract enough water to wet sufficiently allowing removal of residual particles therefrom. (See Fig. 4E, col. 1-10).

With respect to claim 49, the hydrophobic material (402') of Lee comprises silicon.

With respect to claim 50, the hydrophilic material (403) of Lee comprises silicon dioxide.

With respect to claim 51, the regions of hydrophobic material (402') and hydrophilic material (403) of Lee alternate along the surface of the wafer (400).

With respect to claim 52, the regions of hydrophobic material (402') and hydrophilic material (403) of Lee are elongated strips.

With respect to claims 53 and 54, the regions of hydrophobic material (402') and hydrophilic material (403) of Lee are rectangular.

With respect to claim 56, the regions of hydrophobic material (402') of Lee are interspersed within a sea of hydrophilic material (403).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-5, 31-34 and 45-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee '696.

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With respect to claims 2, 3, 31, 32, 45 and 46, the first fraction of Lee appears to be about 50% or 60% since the semiconductor regions (402') and the dielectric regions (403) appear to be evenly spaced. (See Fig. 4A).

With respect to claims 4, 5, 33, 34, 47 and 48, the first width (W) of Lee is about 0.44 mm. (See col. 5, lines 43-47).

Thus, is shown to teach all the features of the claim with the exception of explicitly disclosing the first width of 2.5 mm or 500 μ m.

However, within purview of one having ordinary skill in the art, it would have been obvious to determine the optimum width of the semiconductor region. See *In re Aller, Lacey and Hall* (10 USPQ 233-237) "It is not inventive to discover optimum or workable ranges by routine experimentation". *Critically.*

5. Claims 13, 42 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee '696 as applied to claims 1, 30 and 44 above, and further in view of Inoue (U.S. Patent No. 4,656,054).

Lee teaches semiconductor regions (402') of wafer (400) having various shapes.

Thus, Lee is shown to teach all the features of the claim with the exception of semiconductor regions having a shape of hexagon.

However, Inoue teaches semiconductor regions can be formed in to various shapes using a mask having a particular shapes such as hexagon. (See Fig. 8).

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Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to form the semiconductor region of Lee having hexagonal shapes as taught by Inoue because more semiconductor regions having hexagonal shape can be made in a given area (Fig. 8) than the other shapes (See Figs. 5 and 6).

Furthermore, since it has been held to be within the general skill of a worker in the art to select a known shape strips, rectangular, round, oval, diamond or hexagon on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh D. Mai whose telephone number is (703) 305-0575. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A.M
October 9, 2002


Olik Chaudhuri
Supervisory Patent Examiner
Technology Center 2800